

RAW SEQUENCE LISTING

**The Biotechnology Systems Branch of the Scientific and Technical
Information Center (STIC) no errors detected.**

Application Serial Number: 10/768, 886A
Source: 1FW/6
Date Processed by STIC: 6/2/06

ENTERED



IFW16

RAW SEQUENCE LISTING

DATE: 06/02/2006

PATENT APPLICATION: US/10/768,886A

TIME: 09:48:18

Input Set : A:\MAPK5 (Supp).txt

Output Set: N:\CRF4\06022006\J768886A.raw

3 <110> APPLICANT: Board of Trustees for University of Arkansas
 5 <120> TITLE OF INVENTION: Mitogen-Activated Protein Kinase and Method of Use to
 Enhance
 6 Biotic and Abiotic Stress Tolerance in Plants
 8 <130> FILE REFERENCE: UAF-03-14
 C--> 10 <140> CURRENT APPLICATION NUMBER: US/10/768,886A
 11 <141> CURRENT FILING DATE: 2004-01-31
 13 <160> NUMBER OF SEQ ID NOS: 10
 15 <170> SOFTWARE: PatentIn version 3.2
 17 <210> SEQ ID NO: 1
 18 <211> LENGTH: 1396
 19 <212> TYPE: DNA
 20 <213> ORGANISM: Oryza sativa
 22 <400> SEQUENCE: 1
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 25 aggaggaggg attaggggatg gacggggcgc cgggtggcgga gttcaggccg acgatgacgc 120
 27 acggcgggccg gtacctgctc tacgacatct tcgggaacaa gttcgagggtg acgaacaagt 180
 29 accagccgcc catcatgccc attggccgcg gcgcctacgg gatcgtctgc tccgtgatga 240
 31 acttttgagac gagggagatg gtggcgataa agaagatcgc caacgcgttc aacaacgaca 300
 33 tggacgccaa gcgcacgctc cgggagatca agctcctcag gcacctcgac cacgagaaca 360
 35 tcataggcat cagggatgtg atcccgcgc cgatccctca ggcgttcaac gacgtctaca 420
 37 tcgccacgga gctcatggac accgacctcc atcacatcat ccgctccaac caagaactgt 480
 39 cagaagagca ctgccagtat ttctgtacc agatcctgcg ggggctcaag tacatccact 540
 41 cggcgaaagt gatccaccgc gacctgaagc cgagcaacct gctgctgaac gccaaactgcg 600
 43 acctcaagat ctgcgaactt cggctggcgc ggccgtcgtc ggagagcgac atgatgacgg 660
 45 agtacgtggg caccgcgttg taccgcgcgc cggagctgct gctcaactcc accgactact 720
 47 ccgccgccat cgacgtctgg tccgtcggct gcatttcat ggagctcatc aaccgccagc 780
 49 cgctcttccc cggcagggac cacatgcacc agatgcgcct catcaccgag gtgatcggga 840
 51 cgccgacgga cgacgagctg gggttcatac ggaacgagga cgcgaggaag tacatgaggc 900
 53 acctgccgca gtacccgcgc cggacgttcg cgagcatgtt cccgcgggtg cagcccgccg 960
 55 cgctcgacct catcgagagg atgctcacct tcaacccgct gcagagaatc acagttgagg 1020
 57 aggcgctcga tcatccttac ctagagagat tgcacgacat cgccgatgag cccatctgcc 1080
 59 tggagccctt ctcttcgac ttcgagcaga aggtctaaa cgaggaccaa atgaagcagc 1140
 61 tgatcttcaa cgaagcgatc gagatgaacc caaacatccg gtactagatt gaatcaccat 1200
 63 ggaaatgaga tcccgctcat acctgctttg tacatatgat caagattgag agccgggtag 1260
 65 actgaacatt gcatttgttt gtttgttgat gttcgaaacc cacattctct gcaagttgtg 1320
 67 gctgctttgt atgatatatg gtactatggt cgaataaaaag ggtttggaac tttggattaa 1380
 69 aaaaaaaaaa aaaaaa 1396
 72 <210> SEQ ID NO: 2
 73 <211> LENGTH: 368
 74 <212> TYPE: PRT
 75 <213> ORGANISM: Oryza sativa
 77 <400> SEQUENCE: 2
 79 Met Asp Gly Ala Pro Val Ala Glu Phe Arg Pro Thr Met Thr His Gly

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80 1          5          10          15
83 Gly Arg Tyr Leu Leu Tyr Asp Ile Phe Gly Asn Lys Phe Glu Val Thr
84          20          25          30
87 Asn Lys Tyr Gln Pro Pro Ile Met Pro Ile Gly Arg Gly Ala Tyr Gly
88          35          40          45
91 Ile Val Cys Ser Val Met Asn Phe Glu Thr Arg Glu Met Val Ala Ile
92          50          55          60
95 Lys Lys Ile Ala Asn Ala Phe Asn Asn Asp Met Asp Ala Lys Arg Thr
96 65          70          75          80
99 Leu Arg Glu Ile Lys Leu Leu Arg His Leu Asp His Glu Asn Ile Ile
100          85          90          95
103 Gly Ile Arg Asp Val Ile Pro Pro Pro Ile Pro Gln Ala Phe Asn Asp
104          100          105          110
107 Val Tyr Ile Ala Thr Glu Leu Met Asp Thr Asp Leu His His Ile Ile
108          115          120          125
111 Arg Ser Asn Gln Glu Leu Ser Glu Glu His Cys Gln Tyr Phe Leu Tyr
112          130          135          140
115 Gln Ile Leu Arg Gly Leu Lys Tyr Ile His Ser Ala Asn Val Ile His
116 145          150          155          160
119 Arg Asp Leu Lys Pro Ser Asn Leu Leu Leu Asn Ala Asn Cys Asp Leu
120          165          170          175
123 Lys Ile Cys Asp Phe Gly Leu Ala Arg Pro Ser Ser Glu Ser Asp Met
124          180          185          190
127 Met Thr Glu Tyr Val Val Thr Arg Trp Tyr Arg Ala Pro Glu Leu Leu
128          195          200          205
131 Leu Asn Ser Thr Asp Tyr Ser Ala Ala Asp Val Trp Ser Val Gly Cys
132          210          215          220
135 Ile Phe Met Glu Leu Ile Asn Arg Gln Pro Leu Phe Pro Gly Arg Asp
136 225          230          235          240
139 His Met His Gln Met Arg Leu Ile Thr Glu Val Ile Gly Thr Pro Thr
140          245          250          255
143 Asp Asp Glu Leu Gly Phe Ile Arg Asn Glu Asp Ala Arg Lys Tyr Met
144          260          265          270
147 Arg His Leu Pro Gln Tyr Pro Arg Arg Thr Phe Ala Ser Met Phe Pro
148          275          280          285
151 Arg Val Gln Pro Ala Ala Leu Asp Leu Ile Glu Arg Met Leu Thr Phe
152          290          295          300
155 Asn Pro Leu Gln Arg Ile Thr Val Glu Glu Ala Leu Asp His Pro Tyr
156 305          310          315          320
159 Leu Glu Arg Leu His Asp Ile Ala Asp Glu Pro Ile Cys Leu Glu Pro
160          325          330          335
163 Phe Ser Phe Asp Phe Glu Gln Lys Ala Leu Asn Glu Asp Gln Met Lys
164          340          345          350
167 Gln Leu Ile Phe Asn Glu Ala Ile Glu Met Asn Pro Asn Ile Arg Tyr
168          355          360          365
171 <210> SEQ ID NO: 3
172 <211> LENGTH: 1084
173 <212> TYPE: DNA
174 <213> ORGANISM: Oryza sativa

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176 <400> SEQUENCE: 3

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177 agagagtcag ataaggtcgt taattagggtt ggtcaattcg gctgcttgcg gcgagagaag      60
179 aggaggaggg attagggatg gacggggcgc cgggtggcggg gttcaggccg acgatgacgc      120
181 acggcgggccg gtacctgctc tacgacatct tcgggaacaa gttcgagggtg acgaacaagt      180
183 accagccgcc catcatgccc attggccgcg ggcctacgg gatcgtctgc tccgtgatga      240
185 actttgagac gagggagatg gtggcgataa agaagatcgc caactgcgac ctcaagatct      300
187 gcgacttcgg gctggcgcg cgttcgtcgg aggcgcacat gatgacggag tacgtggtca      360
189 cccggtggta ccgcgcgcc gagctgctgc tcaactccac cgactactcc gccgccatcg      420
191 acgtctggtc cgtcggctgc atcttcattg agctcatcaa ccgccagccg ctcttccccg      480
193 gcagggacca catgcaccag atgcgcctca tcaccgaggt gatcgggacg ccgacggacg      540
195 acgagctggg gttcataccg aacgaggacg cgaggaagta catgaggcac ctgccgcagt      600
197 acccgcgccg gacgttcgag agcatgttcc cgcgggtgca gcccgcgcg ctcgacctca      660
199 tcgagaggat gtcaccttc aaccgcgtgc agagaatcac agttgaggag gcgctcgatc      720
201 atccttacct agagagattg cacgacatcg ccgatgagcc catctgcctg gagcccttct      780
203 ccttcgactt cgagcagaag gctctaaacg aggaccaa atgaagcagctg atcttcaacg      840
205 aagcgatcga gatgaaccca aacatccggt actagattga atcaccatgg aaatgagatc      900
207 ccgtctatac ctgctttgta catatgatca agattgagag ccgggtagac tgaacattgc      960
209 atttgtttgt ttgttgatgt tcgaaaccca cattctctgc aagttgtggc tgctttgtat     1020
211 gatatatggt actatgttcg aataaaaggg tttggaactt tggattaaaa aaaaaaaaaa     1080
213 aaaa                                                                1084

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216 <210> SEQ ID NO: 4

217 <211> LENGTH: 266

218 <212> TYPE: PRT

219 <213> ORGANISM: Oryza sativa

221 <400> SEQUENCE: 4

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223 Met Met Asp Gly Ala Pro Val Ala Glu Phe Arg Pro Thr Met Thr His
224 1 5 10 15
227 Gly Gly Arg Tyr Leu Leu Tyr Asp Ile Phe Gly Asn Lys Phe Glu Val
228 20 25 30
231 Thr Asn Lys Tyr Gln Pro Pro Ile Met Pro Ile Gly Arg Gly Ala Tyr
232 35 40 45
235 Gly Ile Val Cys Ser Val Met Asn Phe Glu Thr Arg Glu Met Val Ala
236 50 55 60
239 Ile Lys Lys Ile Ala Asn Cys Asp Leu Lys Ile Cys Asp Phe Gly Leu
240 65 70 75 80
243 Ala Arg Pro Ser Ser Glu Ser Asp Met Met Thr Glu Tyr Val Val Thr
244 85 90 95
247 Arg Trp Tyr Arg Ala Pro Glu Leu Leu Leu Asn Ser Thr Asp Tyr Ser
248 100 105 110
251 Ala Ala Ile Asp Val Trp Ser Val Gly Cys Ile Phe Met Glu Leu Ile
252 115 120 125
255 Asn Arg Gln Pro Leu Phe Pro Gly Arg Asp His Met His Gln Met Arg
256 130 135 140
259 Leu Ile Thr Glu Val Ile Gly Thr Pro Thr Asp Asp Glu Leu Gly Phe
260 145 150 155 160
263 Ile Arg Asn Glu Asp Ala Arg Lys Tyr Met Arg His Leu Pro Gln Tyr
264 165 170 175
267 Pro Arg Arg Thr Phe Ala Ser Met Phe Pro Arg Val Gln Pro Ala Ala
268 180 185 190

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271 Leu Asp Leu Ile Glu Arg Met Leu Thr Phe Asn Pro Leu Gln Arg Ile
272      195      200      205
275 Thr Val Glu Glu Ala Leu Asp His Pro Tyr Leu Glu Arg Leu His Asp
276      210      215      220
279 Ile Ala Asp Glu Pro Ile Cys Leu Glu Pro Phe Ser Phe Asp Phe Glu
280 225      230      235      240
283 Gln Lys Ala Leu Asn Glu Asp Gln Met Lys Gln Leu Ile Phe Asn Glu
284      245      250      255
287 Ala Ile Glu Met Asn Pro Asn Ile Arg Tyr
288      260      265
291 <210> SEQ ID NO: 5
292 <211> LENGTH: 26
293 <212> TYPE: DNA
294 <213> ORGANISM: Artificial
296 <220> FEATURE:
297 <223> OTHER INFORMATION: gene-specific primer containing restriction site
299 <400> SEQUENCE: 5
300 cgggatccgt cggctgcac ttcacg      26
303 <210> SEQ ID NO: 6
304 <211> LENGTH: 25
305 <212> TYPE: DNA
306 <213> ORGANISM: Artificial
308 <220> FEATURE:
309 <223> OTHER INFORMATION: gene-specific primer containing restriction site
311 <400> SEQUENCE: 6
312 gctctagatt caatctagta ccgga      25
315 <210> SEQ ID NO: 7
316 <211> LENGTH: 20
317 <212> TYPE: DNA
318 <213> ORGANISM: Artificial
320 <220> FEATURE:
321 <223> OTHER INFORMATION: gene-specific primer containing restriction site
323 <400> SEQUENCE: 7
324 gagttcaggc cgacgatgac      20
327 <210> SEQ ID NO: 8
328 <211> LENGTH: 20
329 <212> TYPE: DNA
330 <213> ORGANISM: Artificial
332 <220> FEATURE:
333 <223> OTHER INFORMATION: gene-specific primer containing restriction site
335 <400> SEQUENCE: 8
336 atcggcgatg tcgtgcaac      20
339 <210> SEQ ID NO: 9
340 <211> LENGTH: 368
341 <212> TYPE: PRT
342 <213> ORGANISM: Triticum aestivum
344 <400> SEQUENCE: 9
346 Met Asp Gly Ala Pro Val Ala Glu Phe Arg Pro Thr Met Thr His Gly
347 1      5      10      15

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```

350 Gly Arg Phe Leu Leu Tyr Asn Ile Phe Gly Asn Gln Phe Glu Thr Thr
351      20      25      30
354 Ala Lys Tyr Gln Pro Pro Ile Met Pro Ile Gly Lys Gly Ala Tyr Gly
355      35      40      45
358 Ile Val Cys Ser Val Met Asn Phe Glu Thr Arg Glu Met Val Ala Ser
359      50      55      60
362 Lys Lys Ile Ala Asn Ala Phe Asp Asn Asn Met Asp Ala Lys Arg Thr
363 65      70      75      80
366 Leu Arg Glu Ile Lys Leu Leu Leu Arg His Leu Asp Glu Asn Ile Val
367      85      90      95
370 Gly Leu Arg Asp Val Ile Pro Pro Ala Ile Pro Gln Ser Glu Asn Asp
371      100     105     110
374 Val Tyr Ile Ala Thr Glu Leu Met Asp Thr Asp Leu His His Ile Ile
375      115     120     125
378 Arg Ser Asn Gly Glu Leu Ser Glu Glu His Glu Gln Tyr Phe Leu Tyr
379      130     135     140
382 Gln Leu Leu Arg Gly Leu Lys Tyr Ile His Ser Ala Asn Val Ile His
383 145     150     155     160
386 Arg Asp Leu Lys Pro Ser Asn Leu Leu Leu Asn Ala Asn Cys Asp Leu
387      165     170     175
390 Lys Ile Cys Asp Phe Gly Leu Ala Arg Pro Ser Ser Glu Ser Asp Met
391      180     185     190
394 Met Thr Glu Tyr Val Val Thr Arg Trp Tyr Arg Ala Pro Glu Leu Leu
395      195     200     205
398 Leu Asn Ser Thr Asp Tyr Ser Ala Asn Ile Asp Val Trp Ser Val Gly
399      210     215     220
402 Cys Ile Phe Met Glu Leu Ile Asn Arg Ala Pro Leu Phe Pro Gly Arg
403 225     230     235     240
406 Asp His Met His Gln Met Arg Leu Ile Thr Glu Val Ile Gly Thr Pro
407      245     250     255
410 Thr Asp Asp Asp Leu Gly Phe Ile Arg Asn Glu Asp Ala Arg Arg Tyr
411      260     265     270
414 Met Arg His Leu Pro Gln Phe Pro Arg Arg Ser Phe Pro Gly Phe Pro
415      275     280     285
418 Lys Val Gln Pro Ala Ala Leu Asp Leu Ile Glu Arg Met Leu Thr Phe
419      290     295     300
422 Asn Pro Leu Gln Arg Ile Thr Val Glu Glu Ala Leu Glu His Pro Tyr
423 305     310     315     320
426 Leu Glu Arg Leu His Asp Val Ala Asp Glu Pro Ile Cys Thr Asp Pro
427      325     330     335
430 Phe Ser Phe Asp Phe Glu Gln His Pro Leu Thr Glu Asp Gln Met Lys
431      340     345     350
434 Leu Ile Pro Glu Asn Glu Ala Leu Glu Leu Asn Pro Asn Phe Arg Tyr
435      355     360     365
438 <210> SEQ ID NO: 10
439 <211> LENGTH: 371
440 <212> TYPE: PRT
441 <213> ORGANISM: Nicotiana tabacum
443 <400> SEQUENCE: 10

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RAW SEQUENCE LISTING ERROR SUMMARY DATE: 06/02/2006
PATENT APPLICATION: US/10/768,886A TIME: 09:48:19

Input Set : A:\MAPK5 (Supp).txt
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Invalid <213> Response:

Use of "Artificial" only as "<213> Organism" response is incomplete,
per 1.823(b) of New Sequence Rules. Valid response is Artificial Sequence.

Seq#:5,6,7,8

VERIFICATION SUMMARY

DATE: 06/02/2006

PATENT APPLICATION: US/10/768,886A

TIME: 09:48:19

Input Set : A:\MAPK5 (Supp).txt

Output Set: N:\CRF4\06022006\J768886A.raw

L:10 M:270 C: Current Application Number differs, Replaced Current Application Number